

CLAIMS

What is claimed is:

1. A method for recovering data in a redundant data storage system having a plurality of data storage units, said method comprising:
 - storing said data on said plurality of data storage units according to a redundant data storage method;
 - 5 removing one of said plurality of data storage units;
 - while said one of said plurality of data storage units is removed, changing a portion of said data on the remainder of said plurality of data storage units and storing a record of said changes in a delta file;
 - replacing said one of said plurality of data storage units; and
 - 10 updating said one of said plurality of data storage units by updating those portions of data recorded in said delta file.
2. The method of claim 1 wherein said redundant data storage method comprises RAID 1.
3. The method of claim 1 wherein said redundant data storage method comprises RAID 3.
4. The method of claim 1 wherein said redundant data storage method comprises RAID 5.
5. The method of claim 1 wherein said redundant data storage method comprises remotely mirroring said data.
6. The method of claim 1 wherein said one of said data storage units comprises a plurality of disk drives.
7. The method of claim 1 wherein said delta file comprises pointers to said portion of said data that is changed.
8. The method of claim 1 wherein said delta file comprises an updated version of said portion of said data that is changed.
9. A redundant data storage system capable of fast restoration of serviced data storage units comprising:
 - a plurality of data storage units; and

5 a controller that stores data on said plurality of data storage units
 according to a redundant data storage method, changes a portion of said data
 after taking one of said plurality of said data storage units off line, stores a
 record of the changes in a delta log that are made to the remainder of the
 plurality of said data storage units, brings said one of said plurality of said
 data storage units online, and updates said one of said plurality of said data
 10 storage units by updating those portions of data recorded in said delta file.

10. The redundant data storage system of claim 9 wherein said redundant data
 storage method comprises RAID 1.

11. The redundant data storage system of claim 9 wherein said redundant data
 storage method comprises RAID 3.

12. The redundant data storage system of claim 9 wherein said redundant data
 storage method comprises RAID 5.

13. The redundant data storage system of claim 9 wherein said redundant data
 storage method comprises remote mirroring.

14. The redundant data storage system of claim 9 wherein said one of said data
 storage units comprises a plurality of disk drives.

15. The redundant data storage system of claim 9 wherein said delta file
 comprises pointers to said portion of said data that is changed.

16. The redundant data storage system of claim 9 wherein said delta file
 comprises an updated version of said portion of said data that is changed.

17. A redundant data storage system capable of fast restoration comprising:

a first means for storing data;

a second means that stores data on said first means according to a
 redundant data storage method, changes a portion of said data after taking one
 5 of said first means off line, stores a record of the changes in a third means that
 are made to the remainder of the plurality of said first means, brings said one
 of said first means online, and updates said one of said first means by
 updating those portions of data recorded in said third means.

18. The redundant data storage system of claim 17 wherein said redundant data
 storage method comprises RAID 1.

19. The redundant data storage system of claim 17 wherein said redundant data storage method comprises RAID 3.
20. The redundant data storage system of claim 17 wherein said redundant data storage method comprises RAID 5.
21. The redundant data storage system of claim 17 wherein said redundant data storage method comprises remote mirroring.
22. The redundant data storage system of claim 17 wherein said one of said first means comprises a plurality of disk drives.
23. The redundant data storage system of claim 17 wherein said third means comprises pointers to said portion of said data that is changed.
24. The redundant data storage system of claim 17 wherein said third means comprises an updated version of said portion of said data that is changed.